CLAIMS

We claim:

1. A method for processing communications in a satellite telecommunications system comprising the steps of:

providing a gateway and a satellite coupled together through at least one feeder link, said feeder link conveying a plurality of channel blocks;

code division multiplexing each of said plurality of channel blocks using a predetermined spreading waveform selected to indicate an origin and a destination of each of said plurality of channel blocks;

transmitting said code division multiplexed channel blocks; and,

routing said individual ones of said channel blocks to their destination in accordance with the individual predetermined spreading waveforms.

2. The method of claim 1, wherein said at least one feeder link is a return feeder link.

3. The method of claim 1, wherein said at least one feeder link is a forward feeder link.

4. The method of claim 3 wherein said destination comprises at least a beam of a forward service link.

5. A method for processing communications in a satellite telecommunications system comprising the steps of:

providing a gateway and a satellite coupled together through at least one feeder link, said feeder link having a pre-determined bandwidth and a pre-determined center frequency, and conveying a plurality of channel blocks;

code division multiplexing each of said plurality of channel blocks using a predetermined spreading waveform selected to achieve a spreading bandwidth

corresponding to said predetermined bandwidth and to also to indicate an origin and a destination of each of said plurality of channel blocks; and

upconverting said plurality of code division multiplexed channel blocks such that said plurality of code division multiplexed channel blocks have a center frequency corresponding to said predetermined center frequency.

6. The method of claim 5, further comprising, after the step of upconverting, the steps of:

transmitting said code division multiplexed channel blocks;

receiving said code division multiplexed channel blocks;

de-multiplexing said plurality of channel blocks; and,

routing ones of said plurality of channel block to their destination determined from said predetermined spreading waveform.

7. The method of claim 5, wherein said at least one feeder link is a forward feeder link.

8. The method of claim 5, wherein said at least one feeder link is a return feeder link.

9. A method for processing communications in a satellite telecommunications system comprising the steps of:

providing a satellite and a user terminal coupled together through at least one service link, said service link having a pre-determined bandwidth and a pre-determined center frequency, and conveying a plurality of signals;

code division multiplexing each of said plurality of signals using a predetermined spreading waveform selected to achieve a spreading bandwidth corresponding to said predetermined bandwidth and to indicate an origin and a destination of each of said plurality of signals; and,

upconverting said plurality of code division multiplexed signals such that said plurality of code division multiplexed signals have a center frequency corresponding to said predetermined center frequency.

10. The method of claim 9, further comprising, after the step of upconverting, the steps of:

transmitting said code division multiplexed signals;

receiving said code division multiplexed signals; and,

de-multiplexing said code division multiplexed signals.

11. The method of claim 9, wherein said at least one service link is a forward service link.

12. The method of claim 9, wherein said at least one service link is a return service link.

13. The method of claim 12, further comprising routing said ones of said signals to their destinations determined from said predetermined spreading waveform.

14. A method for processing communications in a satellite telecommunications system comprising the steps of:

providing a satellite and a virtual gateway coupled together through at least one virtual link, said virtual link having a pre-determined bandwidth and a pre-determined center frequency, and conveying a plurality of signals.

code division multiplexing each of said plurality of signals using a predetermined spreading waveform selected to achieve a spreading bandwidth corresponding to said predetermined bandwidth and to indicate an origin and a destination of each of said plurality of signals; and,

upconverting said code division multiplexed communication signals such that said plurality of code division multiplexed signals have a center frequency corresponding to said predetermined center frequency.

15. The method of claim 14, further comprising, after the step of upconverting, the steps of:

transmitting said code division multiplexed signals;

receiving said code division multiplexed signals; and

de-multiplexing said communication signals.

16. The method of claim 14, wherein said at least one virtual link is a virtual downlink.

17. The method of claim 14, wherein said at least one virtual link is a virtual uplink.

18. The method of claim 14, further comprising routing said individual ones of said plurality of signals to their destinations determined from said predetermined spreading waveform.

19. A method for processing communications in a satellite telecommunications system comprising the steps of:

providing a first satellite and a second satellite coupled together through at least one inter-satellite link having a pre-determined bandwidth and a pre-determined center frequency, said inter-satellite link for conveying communication signals between said satellites;

code division multiplexing said communication signals using a predetermined spreading waveform selected to achieve a spreading bandwidth corresponding to said predetermined bandwidth and to indicate an origin and a destination of each of said communication signals; and,

upconverting said code division multiplexed communication signals such that said communication signals have a center frequency corresponding to said predetermined center frequency.

20. The method of claim 19, further comprising, after the step of upconverting, the steps of:

transmitting said code division multiplexed communication signals from said first satellite;

receiving said code division multiplexed communication signals at said second satellite;

de-multiplexing said communication signals; and,

routing said communication signals to their destinations determined from said predetermined spreading waveform.

21. The method of claim 19, wherein said at least one inter-satellite link is a forward inter-satellite link.

22. The method of claim 19, wherein said at least one inter-satellite link is a return inter-satellite link.

23. An apparatus for processing communications in a satellite telecommunications system comprising:

a gateway;

at least one feeder link for conveying a plurality of channel blocks, said feeder link having a pre-determined bandwidth and a pre-determined center frequency;

a satellite coupled with said gateway through said at least one feeder link;

circuitry in each of said satellite and said gateway for code division multiplexing each of said plurality of channel blocks using a predetermined spreading waveform selected to achieve a spreading bandwidth corresponding to said predetermined bandwidth and to indicate an origin and a destination of each of said plurality of channel blocks; and,

circuitry in each of said satellite and said gateway for upconverting said plurality of code division multiplexed channel blocks such that said plurality of code division multiplexed channel blocks have a center frequency corresponding to said predetermined center frequency.

24. The apparatus of claim 23, wherein said gateway and said satellite each further comprise circuitry for de-multiplexing said plurality of channel blocks and using the de-multiplexed channel blocks in a conventional manner.

25. The apparatus of claim 23, wherein said satellite further comprises circuitry for de-multiplexing said plurality of channel blocks and for routing said individual ones of said channel blocks to their destination in accordance with the individual predetermined spreading waveforms.

26. The apparatus of claim 23, wherein said at least one feeder link is a forward feeder link.

27. The apparatus of claim 23, wherein said at least one feeder link is a return feeder link.

28. An apparatus for generating communications in a satellite telecommunications system comprising:

a satellite;

at least one service link for conveying a plurality of signals, said service link having a pre-determined bandwidth and a pre-determined center frequency;

a user terminal coupled with said satellite through said at least one service link;

circuitry in each of said satellite and said user terminal for code division multiplexing each of said plurality of signals using a predetermined spreading waveform selected to achieve a spreading bandwidth corresponding to said predetermined bandwidth and to indicate an origin and a destination of each of said plurality of signals; and,

circuitry in each of said satellite and said user terminal for upconverting said plurality of code division multiplexed signals such that said plurality of code division multiplexed signals have a center frequency corresponding to said predetermined center frequency.

29. The apparatus of claim 28, wherein said satellite and said user terminal each further comprise circuitry for de-multiplexing said plurality of signals and using the de-multiplexed signals in a conventional manner.

30. The apparatus of claim 28, wherein said at least one service link is a forward service link

31. The apparatus of claim 28, wherein said at least one service link is a return service link.

32. The apparatus of claim 28, wherein said satellite further comprises circuitry for de-multiplexing said plurality of signals and for routing said individual ones of said plurality of signals to their destination in accordance with the individual predetermined spreading waveforms.

33. An apparatus for generating communications in a satellite telecommunications system comprising:

a satellite;

at least one virtual link for conveying a plurality of signals, said virtual link having a pre-determined bandwidth and a pre-determined center frequency;

a virtual gateway coupled with said satellite through said at least one virtual link;

circuitry in each of said satellite and said virtual gateway for code division multiplexing each of said plurality of signals using a predetermined spreading waveform selected to achieve a spreading bandwidth corresponding to said predetermined bandwidth and to indicate an origin and a destination of each of said plurality of signals; and,

circuitry in each of said satellite and said virtual gateway for upconverting said plurality of code division multiplexed signals such that said plurality of code division multiplexed signals have a center frequency corresponding to said predetermined center frequency.

34. The apparatus of claim 33, wherein said satellite and said virtual gateway each further comprise circuitry for de-multiplexing said plurality of signals and using the de-multiplexed signals in a conventional manner.

35. The apparatus of claim 33, wherein said at least one virtual link is a virtual downlink.

36. The apparatus of claim 33, wherein said at least one virtual link is a virtual uplink.

37. The apparatus of claim 33, wherein said satellite further comprises circuitry for de-multiplexing said plurality of signals and for routing said individual ones of said plurality of signals to their destination in accordance with the individual predetermined spreading waveforms.

38. An apparatus for generating communications in a satellite telecommunications system comprising:

a first satellite;

a second satellite coupled with said first satellite through said at least one inter-satellite link for conveying communication signals between said satellites, said inter-satellite link having a pre-determined bandwidth and a pre-determined center frequency;

circuitry in each of said first satellite and said second satellite for code division multiplexing each of said communication signals using a predetermined spreading waveform selected to achieve a spreading bandwidth corresponding to said predetermined bandwidth and to indicate an origin and a destination of each of said communication signals; and,

circuitry in each of said first satellite and said second satellite for upconverting said communication signals such that said plurality of code division multiplexed communication signals have a center frequency corresponding to said predetermined center frequency.

39. The apparatus of claim 38, wherein said first satellite and said second satellite each further comprise circuitry for de-multiplexing said communication signals and for using the de-multiplexed communication signals in a conventional manner.

40. The apparatus of claim 38, wherein said at least one inter-satellite link is a forward inter-satellite link

41. The apparatus of claim 38, wherein said at least one inter-satellite link is a return inter-satellite link.

42. A method for processing communications in a satellite telecommunications system comprising the steps of:

providing a gateway and a satellite coupled together through at least one feeder link, said feeder link conveying a plurality of channel blocks ;

code division multiplexing each of said plurality of channel blocks using a predetermined spreading waveform selected to indicate an origin and a destination of each of said plurality of channel blocks, wherein said destination is a beam of a forward service link;

transmitting said code division multiplexed channel blocks; and,

routing said individual ones of said channel blocks to their destination in accordance with the individual predetermined spreading waveforms.